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ABSTRACT

As both draw upon language and experience, and both deal with meaning, writing and reading can be learned concurrently. Writing activities having a positive effect on reading skills include notetaking and sentence combining exercises. A more productive way of improving reading comprehension through writing is to have students base their writing on what they are taught. For example, after learning to recognize cause and effect relationships, students can write on a topic of their choice using cause and effect, first with and then without signal words. Mapping and semantic webbing, activities closely related to writing, also increase comprehension. A writing activity building reading vocabulary has students replace words in a passage with synonyms; cloze passages are also beneficial to vocabulary development. Writing before reading permits a survey of relevant background knowledge, while postreading writing reinforces retention, both of which are beneficial to comprehension. Finally, rearranging out-of-order sentence or paragraph elements can increase the chunking skills used during text processing. (HTH)

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WRITING ACTIVITIES FOR DEVELOPING READING COMPREHENSION

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We have been saying for some time that reading and writing are related - we call them, along with speaking and listening, the language arts.

> Because both tasks depend on a speech base, ... speaking, writing and reading should be handmaids to each other ... They are the main modes for the everyday presentations of an individual's symbolic life and his only means of encountering the day to day symbolic presentations of others. The way to learn to "read," in the sense of understanding the presentations of others, is to prepare one's own presentations so that they can be more easily "read" by others, and to learn to "listen" to what other people are "saying." (13)

Others have expressed similar ideas in a different way.

> ... if the writing process is better understood through systematic practice in building relationships, the ability to uncover relationships in someone else's writing will increase. This emerging model has the potential to complement the writing process and thereby enhance the reading process. (19)

And

> Reading and writing are naturally related and should be brought together ... If we think of writing as a system in itself, it is clear that reading and writing go together in the same way as listening and speaking. (12)

In the past we were told the natural way to learn language was in this sequence: listening and speaking, reading and writing. Now there are suggestions that while some oral language mastery is a prerequisite for learning to read, the learning of writing can occur concurrently with the learning of reading, rather than follow the learning of reading. And it is possible that this concurrent learning will lead to improved learning in both reading and writing. Put another way, what one learns as a result of experiencing and/or using one form of language, could reinforce the learning of the other.

Why might this be so? Reading and writing draw upon the same bases - language, experiences, and similar processes. Both deal with meaning - in one case obtaining

meaning and in the other producing meaning. The nature of thinking required for both causes learners to behave in ways that perhaps are not very different. They use similar strategies to understand what others write and to write in ways that others understand them. Moreover, it is the reinforcement or strengthening of appropriate responses through different but interrelated pathways that could be the more powerful contributor to improved performances in both reading and writing.

RESEARCH ON READING AND WRITING

You will recall that in the 1960s the U. S. Office of Education funded 27 investigations that came to be known as the First Grade Studies. (Some of these studies were extended through the second and third grades.) The purpose of all these studies was to determine the effects of different approaches on reading development. For various reasons on which it would serve no real purpose to dwell at this time, few conclusions which we can accept with confidence can be drawn from the results of these studies. However, there has been some speculation about the results of a group of studies that may be relevant to the issue as to whether or not writing activities have some impact on reading development. Although it is likely that the children who participated in each of the 27 studies did some writing in conjunction with their reading, it was in one approach that writing activities were particularly stressed - the i.t.a. program. In four of the five studies that compared the achievement of children in this program with the achievement of those in other programs, the former significantly outperformed the latter in word recognition. In paragraph comprehension the results favored the i.t.a. children in but one study, while in the other four there were no real differences. Some have speculated that it was the writing - insofar as word recognition was concerned - and not the different alphabetic system that

made the difference. Why the results in comprehension were not similar to those in word recognition might be explained by the nature of writing activities in which children engaged. Incidentally, the results of studies in which language experience reading was compared with basal programs were not too different. Presumably more writing occurred in the former than the latter.

There are a number of investigations that sought to determine whether achievement in one or more aspects of the language arts was accompanied by achievement in others. In a more general study Loban (11) reported strong positive correlations among reading, writing, speaking, and listening skills for children in elementary and secondary grades. Similar findings have been reported by others. *

The results of other "state of affairs" studies limited to reading and writing suggest relationships between them. Lazdowski (9) was able to construct a formula that predicted reading achievement within one grade level with a fairly high degree of reliability from the mean sentence length number of syllables per thought unit and number of polysyllabic words per sentence in children's written compositions. Kuntz(8) reported a close relationship between reading achievement and written syntactic attainment for seventh graders. Takahashi (17) in a review of studies involving good and poor readers reported that syntactic patterns appearing frequently in students' written and oral language were comprehended more easily in reading than less common patterns. From the studies cited and others like them, one might suggest that high performance in one is often accompanied by equally high performance in the other. However, the conclusion that high performance in one leads to high performance in the other cannot be drawn from the results of such studies. Nor can we say that one does not influence the other. The more often results are duplicated, the greater is the likelihood that causality might be inferred.

* Donald A. Hammill and Gaye McNutt, "Language Abilities and Reading: A Review of the Literature on their Relationship." Elementary School Journal, 80 (1980), 269-77.

Sentence Combining

We do have some reports of investigations that sought to determine if certain kinds of writing experiences produce increments in reading comprehension. One such set of studies involve sentence combining. Straw and Schreiner (16) instructed fourth graders in how to combine sentences and found that such written training positively affected growth in reading and listening comprehension. Fisher (5) conducted a study with fifth, seventh, and ninth graders who received instruction in sentence combining. The experiemental groups outperformed the groups that did not engage in these activities on a standardized paragraph reading test. Hughes (7) studied the effects of sentence combining activities on reading comprehension of seventh grade pupils and reported that those who participated in the program did no better on a standardized test of reading comprehension than pupils who did not participate. However, the experimental group improved significantly in its ability to use syntactic and semantic cues when reading was assessed by miscue analysis. In a review of research, White and Karl (19) reported that sentence combining seemed to have a greater effect on writing ability than on reading comprehension. If we should evaluate the validity of all these results, we could raise the question as to whether sentence-combining should receive the credit for enhancing reading comprehension or whether sentence combining in conjunction with the writing of the sentences increased comprehension. We do not know the answer to this question since none of the groups studied combined sentences without writing them. However, it appears that writing that involves sentence combining might have a positive influence on reading comprehension since the former requires chunking of information and recognition of relationships, both of which are requisites for comprehension.

Notetaking

A number of investigations on the effects of paraphrasing and summarizing on content mastery have been reported. Doctorow and others (4) had sixth grade pupils read fairly complex passages and write a sentence summarizing the content of each paragraph as they read it. Both high and low reading groups outperformed on multiple choice and modified cloze tests pupils who did not write summaries in their comprehension of the passages.

Taylor and Berkowitz (18) reported that sixth graders who wrote one sentence summaries after reading a passage in social studies comprehended more than those who used a study guide, answered questions, or just read the passage.

Lindeu and Wittrock (10) had fifth graders write summary sentences, metaphors, analogies and illustrations based on stories they read. Pupils were told to "make pictures in your mind of everything that is happening." They scored significantly higher on comprehension tests than those who engaged in other comprehension activities such as concentrating on word meanings and main ideas.

The results of a study by Bretzing and Kulhavy (1) seem to suggest that perhaps the nature of the writing activity contributes to content mastery. Students who wrote summaries remembered more information than those who copied the information verbatim or took no notes.

Other forms of notetaking and their effects on reading comprehension have been studied. Stoodt and Balbo (14) integrated instruction in outlining and content reading with secondary students. The experimental group made significant gains and outscored the control group. Brown and Smiley (2) found that fifth, seventh and eighth graders who took notes as they read were most proficient in understanding prose.

Other Related Studies

Gipe (6) tested four methods of teaching word meaning: pairing of unknown words with a familiar synonym or definition; adding to a list of words fitting a general category; presenting words in meaningful sentences and requiring pupil responses in writing to a question with a word or phrase that exemplified the target word; and

having pupils write dictionary definitions and sentences using the new words. The context method was the most effective method for good and poor third and fifth grade readers with the association method a close second. In discussing the educational implications of the results, Gipe recommended that "the learner be required to respond in a written manner to demonstrate understanding of a new word."

Stotsky (15) reviewed the effects of dictation on vocabulary development and phrase reading in addition to citing the views of others on its value. She theorized that when pupils write what is dictated, their attention is directed to language usage, vocabulary, and syntax, the result of which reinforces required behavior during reading.

Collins (3) found that expressive writing combined with reading instruction improved students' reading comprehension more than did reading instruction alone.

The aforementioned studies might lend support to the conclusion that writing enhances reading comprehension. I should point out, however, that none of the investigators set out to test the hypothesis that writing does or does not make a difference in reading comprehension. If this were their intention, they could have instructed pupils in the same activity and then assessed the effects of writing or not writing (perhaps with oral presentations) on comprehension.

WRITING FOR READING COMPREHENSION

We have reviewed the case that can be made on theoretical grounds for engaging students in writing activities in the expectation that there will be a "rub off" effect on reading comprehension. We also have noted what research says about some writing activities and their effect upon reading comprehension. We do need other kinds of studies whose primary purpose is to assess the value, if any, of a specific writing activity for improving reading comprehension. It would not, however, be realistic to wait until the evidence is in before we acted. At the very least the instruction in writing students receive could have a positive effect on the quality of their writing. And at the very best they would significantly improve their comprehension of narrative and expository materials as well as become better writers. Who wouldn't settle for some progress

in each?

Before we consider some writing activities whose prospects for improving reading comprehension seem good, let us remember there is a difference between asking students to perform and providing opportunities that will help them learn. Telling is not the same as teaching, particularly when students are weak performers. So inherent in any suggestion is the assumption that we will try to provide help to students who need it. Experience tells us most will.

Sentence Combining

What are some writing activities in which we could engage students? One is sentence combining. There appears to be at least two kinds of sentence combining: one that expands and another that signifies relationships. Let us consider these two sentences:

1) The dog growled.
2) The dog is vicious.

We may combine these sentences and thereby include all the information each offers:

3) The vicious dog growled.

or consider these sentences:

4) Sugar is produced from sugar cane.
5) Sugar is produced also from sugar beets.

When we combine them into one sentence we have:

6) Sugar is produced from sugar cane and sugar beets.

More than two sentences may be combined into a meaningful whole as in the following:

7) Trees lose their leaves in the Fall.

8) These are deciduous trees.
9) Their leaves turn color before dropping.

Now we may combine the information contained in the above:

10) In the Fall the leaves of deciduous trees turn color and drop.
or
11) Deciduous trees, whose leaves first turn color, lose them in the Fall.

In each case we have incorporated the information contained in the three sentences into one.

A second type of sentence combining requires students to establish relationships between or among them as in:

12) Floods often occur in the Spring.
13) Snow and ice melt and cause rivers to overflow their banks.
14) Floods often occur in the Spring since snow and ice melt to cause rivers to overflow their banks.

A causal relationship is established between events and expressed in the composite form as in sentence (14).

How might we establish a relationship between these sentences?

15) Some sections of many European cities are quite modern in appearance.
16) Other sections remind us of medieval times.

We could combine the sentences to read:

17) Some sections of many European cities are quite modern in appearance while others remind us of medieval times.

Here we have combined them to express contrast.

Another relationship-enumeration may be drawn from these sentences as expressed in sentence (21):

18) Wind disperses the seeds of plants.
19) Water disperses the seeds of plants.

20) Animals disperse the seeds of plants.
21) Wind, water, and animals disperse the seeds of plants.

Sentences that reflect other relationships, e.g., time/sequence and conclusions, could be treated similarly. Opportunities to discuss how the ideas in sentences are related and alternate ways of combining them to express such relationships prior to having students write on their own and followed by justification for the ways in which they join them will help students perform independently.

Skill Reinforcement

In my judgment, one of the more productive ways of improving reading comprehension through writing is to have students base their writing on what they are taught to improve their reading comprehension. We know the latter depends in great measure on students' ability to overcome problems associated with vocabulary and literal and inferential meanings. Thus, as we strive to help students deal with these as they read, we also have them apply what they are learning to writing.

Let us assume we are helping students to become aware of the ways in which writers organize information, so that they might understand and remember more of it. Together we analyze appropriate passages they are reading to determine how the information they contain is related. We decide, for example, that for a passage that discusses how fog and clouds are formed, the author uses a pattern of cause and effect as the vehicle of explanation. After recognizing the same pattern of organization in other passages (with and without words that signal the nature of organization) and identify cause(s) and the effect(s), students then try their hand at writing about a topic they know, using the pattern of cause-effect to establish relationships among the statements. They first might write passages containing signal words and later write others without them. Since we are concerned mainly with improving reading comprehension, the writing would be viewed as a reinforcing activity.

The degree to which students were able to write appropriate passages would be some measure of how well they follow the given relationship. Students might assess the passages others write and perhaps suggest changes if they were needed. Similar treatments of reading and writing could be maintained for other organizational forms. Of course, we must not lose sight of the fact it is reading comprehension that is primary. So all writing will be followed by more reading.

Similar treatments can be followed for other aspects of comprehension. Reading for main ideas both stated and implied, recognizing essential and irrelevant information, understanding anaphoric relationships, noting conclusions and generalizations, using context cues for ascertaining word meaning, etc., all may be influenced by the writing we have students do. We recognize some kinds of passages will be more difficult for students to write than others. But with some initial reading competence and help from teachers and peers, students' writing efforts should improve. If difficulties in writing persist, perhaps more time spent on reading for the specific purpose will be reflected in the writing they do.

Mapping

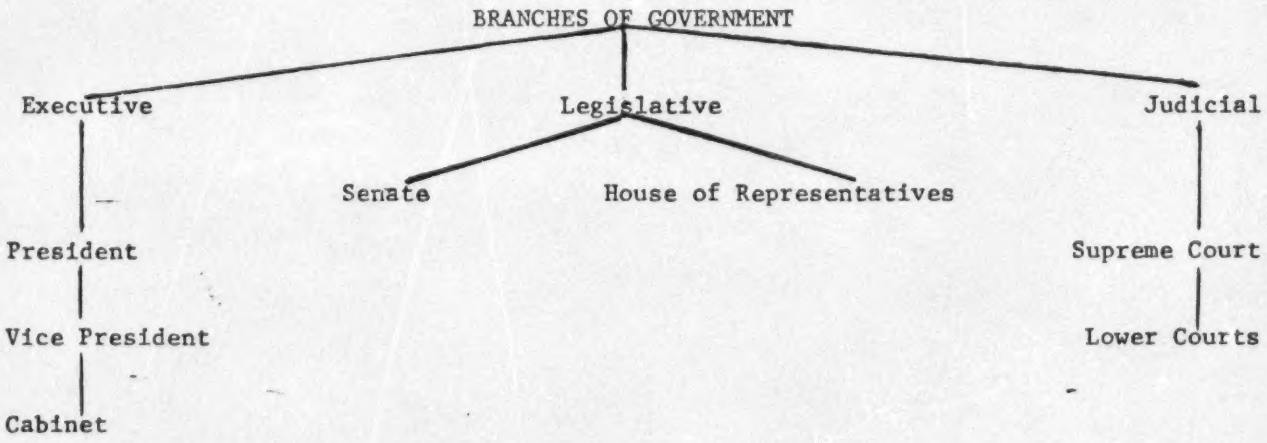
It is not uncommon for students to become confused when they read passages that contain unfamiliar content with details that are significant. One way to help them sort out such details is to suggest they represent them in some graphic form. Naturally, not all content can be illustrated readily, but when it can students could comprehend and remember it better.

The contents of a passage that describes the way in which the blood system works could be mapped in more than one way. Some students might use a system of arrows and labels to show the blood's movement from the heart through the vessels and back to the heart. Others might sketch an outline of the body and indicate the blood's circulation to different parts of it. Once the information is illustrated, students can verify the

accuracy of their representations by comparing the text with them. It is important to remember that the purpose of mapping is to help readers comprehend what they read, and that any representation of the text is for themselves and not for others. Students could contrast their illustrations and decide which ones represent the text more accurately and clearly.

Teachers should discuss with students how they might represent the content of given texts. A diagram might be suitable to show how rainfall occurs, while a time line could be used to trace the development of space exploration from its earliest beginnings to the present. Examination of illustrations in their books will suggest alternate ways to meet their purposes.

A procedure closely related to mapping is what some call semantic webbing. The purpose is to express relationships by tying concepts and ideas together. Here we see how "webbing" might show the relationships that exist within the federal government:



Additional lines could be drawn to show relationships between the houses of Congress, the Courts and Congress, the Executive Branch and Congress, and the system of checks and balances as well as domains and powers of each.

Building Vocabulary

Vocabulary development is an important component of instruction in comprehension, and there is evidence that attention given to it is more productive than casual efforts on its behalf. A writing activity that seems promising is one in which students replace words in sentences and passages with other words that retain their meaning. Thus, an excerpt that contains such words as doctors, sickness, and caused might be replaced by physicians, illness, and produced, respectively. Students might revise in the same way the use of words by other students who write passages about a topic. They would discuss the appropriateness of their substitutions and if need be verify them to determine the extent to which meaning was retained or changed.

Other writing activities, not only for developing and reinforcing vocabulary but also for providing opportunities to organize and relate information and ideas are the completion of individual sentences with one or more deleted words and the addition of one or more sentences to complete a passage. A passage such as the following could be used for both exercises.

Athletes and Extra Minerals*

Some doctors think athletes need more potassium and magnesium than do less active people. Both minerals are used when muscles

* Adapted from William and Barbara Franz, Nutritional Survival Manual for the 80s. New York: Julian Messner, 1981, 95.

contract. Both are lost through sweat. Bananas and oranges are rich in potassium, and dark bread, nuts, and green leafy vegetables are (good sources) of magnesium. If an athlete doesn't get enough of these two minerals, he or she will feel weak and tired.

Athletes need more calories. If they get those extra calories by eating more fruits, vegetables, nuts, and whole grains, they will have plenty of minerals. If the athlete isn't smart, he or she may just eat junk food to get extra calories. That athlete won't get the needed minerals that way. (His or her performance during training and at athletic meets may suffer.)

Note the parallelism of ideas in the sentence of the first paragraph that tells which foods contain potassium and magnesium. The last sentence of the second paragraph expresses an effect whose cause is the lack of needed minerals. Discussion about the appropriateness of words and statements students supply and their explanations for selecting them will reveal how they may establish connections between information both stated and inferred.

An alternate procedure could be one in which teachers offer choices for missing words and sentences. After defending their selections, students also might suggest their own to complete the passage.

Prereading and Postreading Writing

To survey content for general impressions before close reading is one practice that could lead to increased comprehension. A writing exercise that supports such surveys is one in

which students develop paragraphs based on the headings and subheadings of a chapter. Not only does such writing require them to speculate about the nature of the information they are about to study but also stimulate them to think about what they know of the topics. The more students can relate what they know to what they will be reading about, the greater are their chances of understanding and mastering the content. After reading the material, students might indicate which information they included in their own writing and add new information to it.

Another exercise based upon headings and subheadings is the compilation of words and concepts the former suggest. Thus, if the content were about the peoples of the Arctic, the following list of terms might be developed by the students:

Eskimo	Indians
igloo	seals
whaling	tundra
hunting	Laps
pipeline	North Slope
snowmobile	ice fields
reindeer	dogsled

Students would write as much as they know about one or more of the items on the list, read and discuss what they have written, and then read the material. They could verify, add to, and revise what they wrote. Their reading could generate additional ideas for which they would write passages to highlight main ideas, cause and effect relationships, comparisons and contrasts, conclusions, time order, and/or enumeration.

The writing of questions based on the content students read might help to clarify their thinking about the information. Students could exchange questions and write answers to them. Incidentally, the nature of the questions students prepare will reveal whether they are merely concentrating on surface meanings or are thinking more deeply about the content. It also will reveal the extent to which students tie together what they are learning. An alternate activity is one in which students write answers to questions they develop from the content, and other students generate questions that fit answers. For example, a statement such as

> The remora and shark live together and share their food.

might generate a question such as

> How do some animals depend upon each other?

or

> What is the relationship between the remora and shark?

or

> Why do some animals depend on each other? Is this true of all animals?

Question formulation as students read helps to establish purposes for reading and keeps them thinking about what they are reading. Both facilitate comprehension.

A variety of related writing activities which have some support from the results of research include, paraphrasing, summarizing, and outlining. Each requires learners to categorize information into logical blocks that could help them clarify their thinking and lead to more learning. The act of writing forces the "nailing down" of fuzzy ideas, a condition not too infrequently absent when we react orally to printed prose.

Other Writing Activities

The rearranging and writing of out-of-order words, phrases and clauses into meaningful idea units is an activity that may facilitate understanding of sentence structure and contribute to comprehension. In addition, there is some evidence that poor comprehenders are not good "chunkers," that is, they do not tend to process words into meaningful units but deal with them individually.

We might help students process idea units by presenting out-of-order components of sentences and have them rearrange these components into meaningful wholes. They could ask themselves such questions as 'Who or what is causing an action or receiving the results of an action?' 'What is the action?' The following out-of-order words could be identified in this way:

the mid-Atlantic states paralyzed in 36 years
the worst winter storm.

'Who or what is causing an action?' the worst winter storm

'What is the action?' paralyzed

'Who or what is the receiver of the action?' the mid-Atlantic states

Thus the components would be rearranged to read

The worst winter storm paralyzed the mid-Atlantic states.

Any additional information--in this case "in 36 years"--would be added to complete the sentence.

Other out-of-order word groupings in which there is no doer or receiver of an action could be shifted by responding to such questions as 'What or who is discussed?' and 'What is said about the who or the what?'

by its colleges is dominated the heart of Oxford.

'Who or what is discussed?' the heart of Oxford

'What is said about it?' is dominated by its colleges

If students can manage these larger thought units, they can generate sentences in which the components are smaller idea units, that is, individual words and groups of words.

Sentence rearrangement is another writing activity that might ultimately lead to greater chunking. Teachers could select passages from books and other materials students were reading and reorder the sequence of their sentences. Students would discuss what the proper order of the sentences might be and how they reached that judgment. Comparisons with the original passage

would serve as a model. It is possible alternate reordering of some sentences (for example, if the passage contained a stated main idea) wouldn't change the meaning.

IN SUMMARY

There is sufficient reason on both theoretical grounds and the results of limited research and deomonstration to encourage and include writing as one aspect of a program for reading comprehension development. Secondary effects on the writing ability of students are real possibilities, the need for which has led to the institution of programs of "writing across the curriculum." Writing for either purpose might benefit both.

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